

NOTES ON WEATHER IN OTHER PARTS OF THE WORLD.

North Atlantic Ocean.—On April 8 the U. S. Hydrographic Office sent out a notice to mariners urging them to shift the sailing routes 60 miles southward because of the numerous ice fields in the regular steamer lanes.

Central Europe.—According to press advices the great drought which had persisted for six months over Central Europe, particularly in Switzerland, Austria, Hungary, and Rumania, was brought to an end in early April by the advent of heavy snows in the Alps and copious rains in the lowlands. Prior to this precipitation period, agricultural conditions had reached an acute crisis. In Switzerland and Austria there was little pasture for cattle and hence little butter, milk, or cheese.

British Isles.—There was a very general deficiency in rainfall throughout the British Isles during April. Only restricted areas in England, Wales, and Ireland had as much as 2 inches. The general rainfall, expressed as a percentage of the average, was: England and Wales, 59; Scotland, 61; Ireland, 46; British Isles, 56.

In London (Camden Square) the month was fine and pleasantly mild, but with a cold snap and snow showers between the 15th and 17th. The mean temperature was 49.5° F., or 1.5° F. above the average.¹

France.—Temperature in France, which had been unusually high, fell rapidly, and on the 15th the rain turned to snow and sleet, which lasted for several days.

Mexico.—A severe eruption of the volcano of Popocatepetl occurred early in April. This is a recrudescence of the activity which began in the spring of 1920, after 200 years of quietude. In the past the dust associated with volcanic eruptions has been responsible for considerable meteorological effects, especially a diminution in the heat and light from the sun, and brilliant sunset coloration, a noteworthy example being Krakatoa in 1883, and it will be interesting to observe if similar effects follow in this case.¹

¹ *The Meteorological Mag.*, May, 1921, 56: 111-112.

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DETAILS OF THE WEATHER OF THE MONTH IN THE UNITED STATES.

CYCLONES AND ANTICYCLONES.

By W. P. DAY, Observer.

Low-pressure areas were numerous, many of which first took form over the southwestern States, grew in intensity over the central valleys but lost energy as they approached the coast or the northern border. Hudson Bay HIGHS were persistent during much of the month and effectively deranged the normal movement of weather.

The table below gives the number of HIGHS and LOWS by types:

Lows.

	Al- berta.	North Pa- cific.	South Pa- cific.	North- ern Rocky Moun- tain.	Colo- rado.	Tex- as.	East Gulf.	South Atlan- tic.	Cent- ral.	Total.
April, 1921.....	5.0	.....	3.0	2.0	2.0	4.0	.....	3.0	1.0	20.0
Average number, 1892-1912.....	3.4	1.6	0.9	0.5	1.3	1.0	0.3	0.6	0.7	10.3

Highs.

	North Pacific.	South Pacific.	Al- berta.	Plateau and Rocky Moun- tain region.	Hud- son Bay.	Total.
April, 1921.....	3.0	.....	3.0	1.0	5.0	12.0
Average number, 1892-1912.....	1.6	1.6	3.1	1.0	0.6	7.9

THE WEATHER ELEMENTS.

By P. C. DAY, Climatologist and Chief of Division.

[Weather Bureau, Washington, June 1, 1921.]

PRESSURE AND WINDS.

During the first half of the month pressure changes continued slight in the main, and the lull in cyclonic and anticyclonic activities that had marked the preceding months of the present year continued, except that unusually high pressure of the Hudson Bay type overspread the Northeastern States and Canadian Maritime

Provinces near the middle of the first decade, and pressure was high over the central valleys and southeastern districts during the latter part of the first and the early part of the second decades.

Near the middle of the month, however, the weather became more unsettled, particularly over the Southwest, where on the morning of the 15th pressure was unusually low and stormy conditions existed over practically all districts eastward and northeastward. This storm in its eastward movement brought the heaviest precipitation of the month over most central and eastern districts and was accompanied by heavy, wet snow and high winds over portions of the Great Lakes region, and thence eastward, causing interruptions to wire communications, while to the southward tornadoes, thunderstorms, and high winds caused death or injury to a number of persons, and heavy property losses. This was promptly followed by a high pressure area of considerable magnitude, and during the 17th and 18th unusual cold was experienced in the central valleys and southern districts, particularly in Texas, Oklahoma, Arkansas, and portions of adjoining States.

By the first of the third decade pressure had again become low in the Southwest, and cloudy, rainy conditions soon overspread the central valleys, precipitation becoming general during the following two or three days over all districts from the Mississippi River eastward, the falls in general being the second heaviest of the month in numerous sections. As this storm was passing into the ocean from off the southern New England coast a third storm area of wide extent was developing in the Southwest, attended by unusually low pressure, the barometer at Roswell, N. Mex., on the morning of the 24th reduced to sea level, indicating a value of 29.22 inches, the lowest ever observed at that station.

This storm area moved slowly eastward but without the usual precipitation in advance of the center, due doubtless to the strong southerly winds and rapidly rising temperature along its eastern front. Later on, however, thunderstorm conditions developed in the Mississippi Valley districts, and by the morning of the 27th a storm of considerable intensity was central in the upper Lake region, which gradually moved northerly toward the Hudson Bay district during the following day. Offshoots from this, however, appear to have

developed in the eastern districts, bringing unsettled weather with local showers from the Ohio Valley eastward to the Atlantic coast and northeastward to New England.

The pressure for the month as a whole exhibited the type that prevailed so persistently during the past winter and so far this spring, higher than normal over the southern districts and comparatively low along the northern border. As in preceding months, southerly winds prevailed extensively in all districts from the Great Plains eastward, extending into the far Northern States.

A slight decrease in pressure over the plateau region as compared with the normal, and a corresponding or larger excess over the Pacific Coast States, particularly in the more northern districts and extending into the far western Canadian Provinces, caused a general drift of cool northerly or westerly winds into the districts west of the Rocky Mountains.

In the absence of marked variations in pressure, wind velocities were not usually high over any extensive areas although some severe local storms occurred, notes regarding which follow at the end of this paper.

TEMPERATURE.

The daily variations in temperature during the month were unusually small, and while there were several periods of severe cold for the season, these were mostly the result of several days of falling temperature.

The principal periods of cold were on the 7th and 8th, when the lowest temperatures of the month occurred over the greater part of the Rocky Mountain and plateau regions, extending during the 9th and 10th into the Great Plains, and during the following two days over most of the central valleys and eastern districts. In the far Southwest this period gave temperatures as low as, or lower than, had ever been observed in April. On the 16th and 17th cold weather again overspread the eastern Plains and portions of the Mississippi Valley, the lowest temperatures of the month occurring over the States immediately west of the Mississippi River from Iowa to the Gulf of Mexico. At points in Arkansas and along the Texas coast the temperatures during this period were likewise the lowest ever experienced so late in the month. The last decade was mostly free from temperatures unusual to the season, although about the 24th and 25th the coldest weather of the month was reported from small areas in the middle Rocky Mountain and Plateau districts.

Temperatures below zero were reported from several western mountain States and from exposed points in northern Maine, and freezing temperatures occurred in all parts of the country at some time during the month, save in portions of Florida and along the immediate south Atlantic, Gulf, and Pacific coasts, and at the lower elevations of California and southern Arizona.

The periods of greatest heat were widely scattered throughout the month, the most extensive being on the 3d and 4th, in the Rocky Mountain and adjacent regions, and about the 25th and 26th over most districts from the Great Plains eastward to the Atlantic. The last few days were the warmest of the month in the far Southwestern States when temperatures passed above 100° F. at points in Arizona and southern California.

The mean temperature of the month continued above the normal, as has been the case for a number of months over all northern and central districts from the Great Plains eastward, the month being particularly warm in

the Great Lakes, Ohio Valley, and Atlantic Coast States, where locally it was the warmest April of record.

In sharp contrast with the persistent warmth of the eastern districts of the United States, the temperatures to the southeastward appear to have been unusually low. At San Juan, P. R., the month was cold throughout, in fact no day had temperature above the normal and the average for the month was the lowest of record for April.

From the middle Gulf States westward to the Pacific coast, and generally in the Rocky Mountain and plateau regions, the month was cooler than the average, and decidedly so in Idaho and portions of adjoining States.

PRECIPITATION.

Principal periods of precipitation during the month were on the 1st over the eastern quarter of the country, where the falls were general and locally heavy; from the 6th to 9th when rainy conditions moved slowly from the Rocky Mountain region to the Atlantic coast, during which time the heaviest rainfall of the month occurred at points in Texas and over considerable areas in the Ohio and Mississippi Valleys; from the 13th to 17th, when precipitation was general, and frequently copious, from the southern Plains eastward and northeastward to the Atlantic coast, some unusually heavy snows occurring in northern Illinois, southern Wisconsin, and portions of adjoining States; about the 21st to 24th from the eastern Plains to the Atlantic coast precipitation was general and locally heavy in portions of the Mississippi Valley and Gulf States. This was almost immediately followed by a stormy period, which prevailed during the latter part of the month from the Rocky Mountains eastward, attended by local showers and occasionally heavy rains.

For the month as a whole precipitation was generous and above normal from central Texas and the middle Gulf States northeastward to the Great Lakes and New England, and it was usually sufficient for present needs over most other districts from the Great Plains eastward, and generally over the central and northern Rocky Mountain districts, and in the far Northwest.

In portions of the Southwest, the month was entirely without precipitation, and the drought was becoming severe particularly in western Texas, southern New Mexico, and portions of Nevada.

SNOWFALL.

Heavy falls of snow in the central Rocky Mountains during April added materially to the depths previously accumulated, and there were considerable additions to the snow cover in the high mountains of Utah and northern Nevada. But little snow seems to have fallen in the mountains of California and thence northward, except locally in Washington.

Heavy snow for the season of the year occurred on the 16th and 17th, from the Great Plains eastward to the Lake region, the falls in Iowa, northern Illinois, and southern Wisconsin, ranging frequently up to as much as 12 inches, the heaviest ever recorded in April. The general distribution of snowfall over the country is indicated on Chart VIII of this REVIEW.

RELATIVE HUMIDITY.

There was much diversity in the moisture distribution, which appeared to show little relation to the rainfall conditions. In general, relative humidity was above

normal in the Middle and North Atlantic States, over the Great Lakes, and portions of the Ohio and Mississippi Valleys and in the central Rocky Mountain and Plateau regions. It was usually less than normal in the Appalachian Mountains, the East Gulf and South Atlantic States, and from Texas westward to the Pacific.

LOCAL STORMS.

April 5.—Early in the morning a severe storm swept over Wharton, Wharton County, Tex., injuring two people and causing about \$40,000 property loss.

Also, during the night a tornado caused about \$250,000 property damage at Clarendon, Donley County, Tex. No loss of life.

April 6.—A small tornado occurred near Beyersville, Williamson County, Tex., about 8 a. m. The storm

April 15-16.—Severe local storms traversed portions of seven counties in Mississippi, causing the loss of two lives, injury to about 25 persons, and considerable property damage. Full details of this storm are published in another portion of this REVIEW.

April 16.—Four tornadoes occurred in the early morning in Tennessee (see fig. 2), resulting in 2 people killed, and about 30 injured, and property loss of about \$100,000. Details are published on pages 198-199, above.

A severe storm during the morning at Birmingham, Ala., injured a number of persons and caused property loss estimated at \$100,000 to \$200,000. At other points in Alabama storms of tornadic character, together with severe local thunderstorms and heavy rains, caused the death of more than a dozen persons, injury to more than 50, and damage estimated at more than \$1,000,000. Full details of these storms are published on pages 197-198.

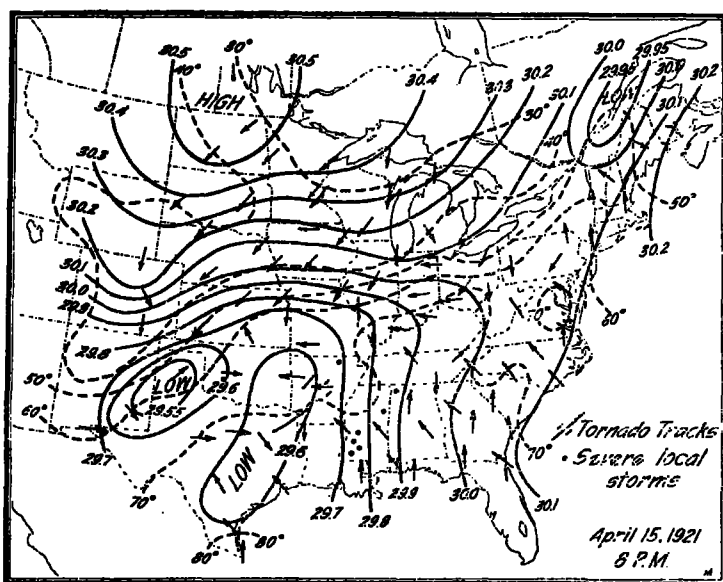


Fig. 1.

covered a distance of about 20 miles from near Elgin in the extreme northwestern part of Bastrop County to near Thorndale in the extreme southwestern part of Milam County. Width of storm averaged from 80 to 100 feet. No loss of life, due partly to sparsely settled conditions. Property loss about \$20,000. About fifteen houses destroyed.

April 13.—A tornado struck the town of Melissa in northern Texas at 2:45 p. m. The storm covered a wide area and swept as far south as Jacksonville, Tex. Eight persons were killed, and more than fifty injured. Practically every building in the business section of Melissa and many dwellings were demolished.

April 15.—A series of four tornadoes occurred in northern Texas and western Arkansas. The principal storm was first observed in northern Texas, but no great damage occurred until it had crossed the State boundary into Arkansas. The others were less destructive and were all confined to the latter State. (See fig. 1.) Full details covering these storms appear in another portion of this REVIEW.

April 15-16.—A severe gale and blizzard moved from Colorado to the upper Lake region. From six to sixteen inches of snow fell and much damage resulted from the wind and heavy snow. (See weather maps, figs. 1 and 2.)

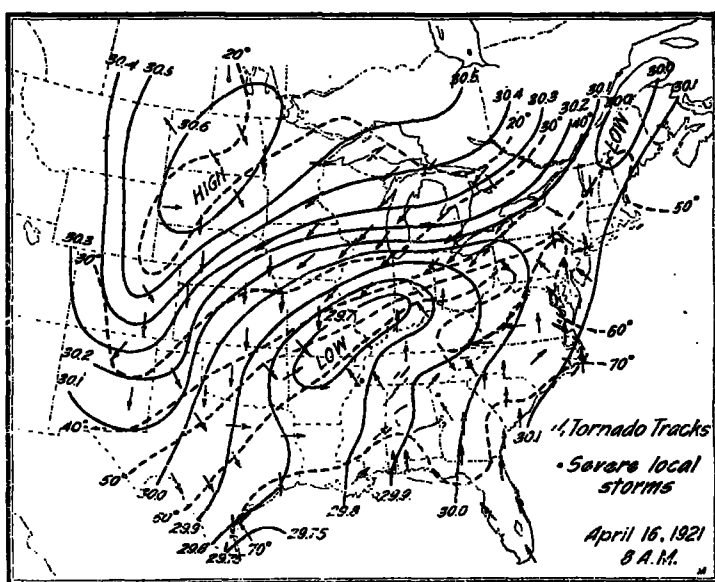


Fig. 2.

April 16-17.—Severe storm with heavy wet snow at Port Huron, Mich., caused much damage to overhead wire systems.

April 19.—A heavy wind storm occurred in the vicinity of Otto, Santa Fe County, N. Mex., during the afternoon, causing considerable property loss.

April 22.—A storm having some features of a tornado occurred near Thomasville, Ga., during the afternoon. Path about 4 miles long and 20 yards wide. No lives lost and property damage about \$1,000.

April 23.—A small tornado visited portions of Polk County, Fla., about 50 miles east of Tampa, during the early morning and destroyed a number of houses and caused property loss of about \$20,000. No one killed but several injured.

April 25.—A few persons were injured and considerable property damage occurred in several central and mid-western counties of Wisconsin during a severe wind storm.

Muscatine, Iowa, was visited about noon by a severe wind storm. Several buildings were unroofed or blown down. Also, during the afternoon in the vicinity of Dubuque, Iowa, a severe storm caused considerable property loss.

Central Illinois was likewise visited by a severe wind and rain storm during the night of the 25th that destroyed some property.